

Claims:

1. A method for operating a food product molding machine of the type having horizontally operable feed ram means disposed to move reciprocally in a feed chamber receiving food product from a supply, said ram means movable through a forward stroke to transfer food product from the feed chamber through a distribution manifold and into a mold cavity of a mold plate in a fill position, which mold plate is cycled in a linear reciprocal path defined by a return stroke to the fill position and an opposite discharge stroke to a discharge position, a vertically reciprocable knock-out device operable to pass through the mold plate in the discharge position to push the product from the mold cavity, and a pair of parallel laterally spaced linear drive shafts supporting the mold plate for movement therewith along the linear mold path, the method comprising the steps of:

(1) driving the linear drive shafts to continuously cycle the mold plate in its reciprocal path;

(2) monitoring the mold plate position over the full cycle of mold plate movement;

(3) generating control signals representative of mold plate position;

(4) commencing forward movement of the ram means and the feed of a moldable food product to the mold plate cavity in response to a fill-on control signal;

(5) terminating forward movement of the ram means and the feed of the food product to the mold cavity in response to a fill-off control signal;

(6) holding the mold plate for a discharge dwell time in the discharge position in response to a discharge position signal; and,

(7) selectively adjusting the discharge dwell time to vary the mold plate cycle time.

2. The method as set forth in claim 1 wherein said fill-on control signal is generated during the return stroke.

3. The method as set forth in claim 1 wherein said fill-off control signal is generated during the discharge stroke.

4. The method as set forth in claim 1 including the step of holding the mold plate for a dwell time in the fill position in response to a fill position signal.

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5. A method as set forth in claim 1 wherein said feed ram means comprises a pair of alternately operable feed rams, each ram adapted to move through one forward stroke over multiple mold plate cycles and to return in a reverse stroke in response to an end of stroke signal, said end of stroke signal operable to cause initial movement of the other ram through a forward stroke, said method also including the step of utilizing the fill-on and fill-off control signals to provide a mold fill period of delay of the response to said end of stroke signal.

6. A method for operating a food patty molding machine of the type having a mold plate with a mold cavity, which plate is cycled in a linear reciprocal path defined by a return stroke to a fill position, an opposite discharge stroke to a discharge position, and a discharge dwell time in the discharge position, said method comprising the steps of:

(1) providing a drive for continuously cycling the mold plate in its reciprocal path;

(2) monitoring the mold plate position over the full cycle of mold plate movement;

(3) generating control signals representative of mold plate position;

(4) commencing to feed a moldable food product to the mold plate cavity in response to a fill-on control signal generated during the return stroke;

(5) terminating the feed of the food product to the mold cavity in response to a fill-off control signal generated during the discharge stroke; and,

(6) varying the time of the full cycle of mold plate movement by adjusting the discharge dwell time.

7. The method as set forth in claim 6 including the step of holding the mold plate for a dwell time in the fill position to provide a fill dwell time.

8. The method as set forth in claim 7 including the steps of:

(1) adjusting the fill dwell time to compensate for a product processing change; and,

(2) adjusting the discharge dwell time oppositely by amount equal to the fill dwell time adjustment to maintain a constant cycle time.

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9. A drive apparatus for operating a food product molding machine of the type having a pair of alternately operable feed rams disposed to move reciprocally in a feed chamber receiving food product from a supply, said ram means movable through a forward stroke to transfer food product from the feed chamber through a distribution manifold and into a mold cavity of a mold plate in a fill position, which mold plate is cycled in a linear reciprocal path defined by a return stroke to the fill position and an opposite discharge stroke to a discharge position, said mold plate being movable through multiple cycles during each forward stroke of one of the rams, a vertically reciprocable knock-out device operable to pass through the mold plate held for a discharge dwell time in the discharge position to push the product from the mold cavity, and a pair of parallel laterally spaced linear drive shafts supporting the mold plate for movement therewith along the linear mold path, the apparatus comprising:

(1) means for driving the linear drive shafts to continuously cycle the mold plate in its reciprocal path;

(2) means for monitoring the mold plate position over the full cycle of mold plate movement and for generating control signals representative of mold plate position;

(3) means responsive to a fill-on control signal for commencing forward movement of one of the rams and the feed of a moldable food product to the mold plate cavity ;

(4) means responsive to a fill-off control signal for terminating forward movement of said one ram and the feed of the food product to the mold cavity; and,

(5) means responsive to a discharge position signal for holding the mold plate for a selectively variable discharge dwell time.

10. The apparatus as set forth in claim 9 wherein said fill-on signal is generated during the return stroke.

11. The apparatus as set forth in claim 9 wherein said fill-off signal is generated during the discharge stroke.

12. The apparatus as set forth in claim 9 including means responsive to a fill position signal for holding the mold plate in the fill position for a selectively variable fill dwell time.

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13. The apparatus as set forth in claim 9 including:
means responsive to an end of ram feed stroke signal
for reversing said one ram and for commencing the feed stroke of
the other ram; and,

5 delay means for holding response to said end of feed
stroke signal until generation of the next fill-off signal.

14. The apparatus as set forth in claim 12 including
means for adjusting the discharge dwell time in response to a
change in fill dwell time to maintain a constant mold plate cycle
time.

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